



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,844	02/01/2001	Linda M. Braun	BRAUN1-18-15	3565

7590

03/01/2004

Glen E. Books, Esq.  
Lowenstein Sandler PC  
65 Livingston Avenue  
Roseland, NJ 07068

EXAMINER

WANG, GEORGE Y

ART UNIT PAPER NUMBER

2871

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/773,844

Applicant(s)

BRAUN ET AL.

Examiner

George Y. Wang

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,6 and 8-20 is/are pending in the application.  
4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-3,6 and 8-11 is/are rejected.  
7) ☒ Claim(s) 2,9 and 10 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 24 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 29, 2003 has been entered.

### ***Election/Restrictions***

2. Newly submitted claims 12-20 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-3, 6, and 8-11, drawn to a variable optical delay line, classified in class 385, subclass 15.
- II. Claims 12-20, drawn to a method of making and causing delay, classified in class 385, subclass 37.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the

Art Unit: 2871

process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process as claimed in Group II can be used to form an optical coupler having control elements that control the fiber gratings coupler for use only on substrates. Group I is directed to a variable optical delay line having specific curved regions and differing by millimeters and does not require operation of control elements and contains multiple switching elements.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 12-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Objections***

5. Claims 2 and 9-10 are objected to because of the claims recites the limitation "the optical switch." There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Note: For the purpose of examination, Examiner assumes that the optical switch refers to the separately switchable reflectors.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-3, 6, and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thaniyavarn (U.S. Patent No. 5,729,642) in view of Soref (U.S. Patent No 4,671,605, from hereinafter "Soref") and Meli (U.S. Patent No. 5,793,508).

2. As to claim 1, Thaniyavarn discloses a waveguide array (fig. 3, ref. 46) having a plurality of fibers (fig. 3, ref. 48a, 48b, 48c) disposed in a closely spaced array, the array comprising a first parallel region, a curved region, and a second parallel region where each fiber having a first end disposed in a first linear array and second end disposed in a second linear array, the second linear array comprising fixed reflectors (fig. 1, ref. 15), and the curved regions of the fibers differ in radii of curvature to provide a successive series of monotonically different path lengths that differ by a few millimeters or less. Thaniyavarn further teaches an optical switch (fig. 1, ref. 9) for switching at least one input signal among the fibers.

However, the reference fails to specifically disclose the array for use in a variable optical delay line and a plurality of separately switchable reflectors disposed in each fiber.

Meli discloses an optical telecommunications system having wavelength division multiplexers and delay lines that use a Bragg reflective element that is switchable between reflection and transmission (col. 5, lines 23-30; fig. 1, ref. 13). Soref disclose the application of the array in a variable optical delay line (fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the array in a variable optical delay line since one would be motivated by use adapt the device for variable optical delay application (Thaniyavarn, col. 5, lines 12-25). Furthermore, because it is well known that an optical time delay is a direct function of optical length (Soref, col. 2, lines 51-63), it would have been obvious to one of ordinary skill in the art the time the invention was made to use a plurality of

switchable reflectors since one would be motivated to reflect radiation in a narrow wavelength band and transmit the radiation outside of this band (Meli, col. 5, lines 23-30). In addition, because the refractive index has a periodic variation, the signal portions are reflected at each index change in a timed relationship, which is ideal for optical delay systems (col. 5, lines 23-30).

3. As per claims 2 and 9, Thaniyavarn and Soref disclose the variable delay line as recited above wither the optical switch comprises a MEM mirror optical switch (fig. 1, ref. 14).

4. Regarding claims 3 and 6, Thaniyavarn and Soref disclose the variable delay line as recited above. However, Thaniyavarn fails to specifically teach a reflective Bragg grating.

Meli discloses an optical telecommunications system having wavelength division multiplexers and delay lines that use a reflective Bragg grating (col. 5, lines 23-30; fig. 1, ref. 13).

It would have been obvious to one of ordinary skill in the art the time the invention was made to use a reflective Bragg grating since one would be motivated by its ability to reflect radiation in a narrow wavelength band and transmit the radiation outside of this band (col. 5, lines 23-30). Furthermore, because the refractive index has a periodic variation, the Bragg grating reflects signal portions at each index change in a timed relationship, which is ideal for optical delay systems (col. 5, lines 23-30).

5. As to claim 8, Thaniyavarn and Soref disclose the variable optical delay line as recited above where the plurality of optical fibers are secured on a substrate support that is a sheet (fig. 3, ref. 46).

6. Regarding claims 10-11, Thaniyavarn et al. discloses the variable optical delay line as recited above where one optical input signal and the optical switch comprises an NxN MEM switch (Thaniyavarn, fig. 1), where the inputs signals are of varying wavelengths (Meli, abstract).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-3, 6, and 8-11 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's main argument is that the prior art of record fails to teach optical length-dependent delay that result in fine and coarse delays. Examiner notes that the Thaniyavarn et al. references clearly teach the structure of the variable optical delay line structures as claimed by Applicant. The features which Applicant asserts are distinguishable are not substantiated by the language of the claimed structure. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies, such as fine and coarse delay adjustments do not contain patentable weight since they deal with the device's intended use. Although the claims are interpreted in light of the



Art Unit: 2871

specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Therefore, Examiner holds to the validity of the references and maintains rejection.


### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gw  
February 3, 2004

  
ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800